



Dec 2, 2022

Secretary Yellen
Internal Revenue Service,
CC:PA:LPD:PR (Notice 2022-58),
Room 5203, P.O. Box 7604,
Ben Franklin Station,
Washington, DC 20044

RE: FOR INTERNAL REVENUE SERVICE REQUEST FOR COMMENTS ON CREDITS FOR CLEAN HYDROGEN AND CLEAN FUEL PRODUCTION (NOTICE 2022-58)

CRS appreciates this opportunity to submit comments in response to the Internal Revenue Service (IRS) request for comments on credits for clean hydrogen and clean fuel production (Notice 2022-58). Please find our responses to selected questions in Sec. 3 of the Notice, Request for Comments, below.

BACKGROUND ON CRS AND GREEN-E®

CRS is a 501(c)(3) nonprofit organization that creates policy and market solutions to advance sustainable energy. CRS provides technical guidance to policymakers and regulators at different levels on renewable energy policy design, accounting, tracking and verification, market interactions, and consumer protection. CRS also administers the Green-e® programs. For over 20 years, the Green-e® program has been the leading independent certification for voluntary renewable electricity products in North America. In 2021, the Green-e® Energy program certified retail sales of over 110 million megawatt-hours (MWh), serving over 1.3 million retail purchasers of Green-e® certified renewable energy, including over 309,000 businesses.¹ The Green-e® Renewable Fuels program was launched in 2021, initially as a standard and certification for biomethane products and associated environmental attributes. This program is in the process of expanding to certify green hydrogen transactions and programs and can serve as a guide for IRS as it helps accelerate the adoption of biomethane and green hydrogen, while ensuring that they are from sustainable renewable resources and meet the highest environmental standards, and that customers are protected in their purchase and ability to make verified usage claims.

¹ See the 2022 (2021 Data) Green-e® Verification Report (soon to be published) here for more information: <https://www.green-e.org/verification-reports>

RESPONSES TO REQUEST FOR COMMENTS

Question 1(e):

How should qualified clean hydrogen production processes be required to verify the delivery of energy inputs that would be required to meet the estimated lifecycle greenhouse gas emissions rate as determined using the GREET model or other tools if used to supplement GREET?

Please see response to Question 4(f).

Question 1(e)(i):

How might clean hydrogen production facilities verify the production of qualified clean hydrogen using other specific energy sources?

Please see response to Question 4(f).

Question 1(e)(ii):

What granularity of time matching (that is, annual, hourly, or other) of energy inputs used in the qualified clean hydrogen production process should be required?

Please see response to Question 4(g).

Question 4(f):

Should indirect book accounting factors that reduce a taxpayer's effective greenhouse gas emissions (also known as a book and claim system), including, but not limited to, renewable energy credits, power purchase agreements, renewable thermal credits, or biogas credits be considered when calculating the § 45V credit?

Renewable energy credits, power purchase agreements, or other market structures for characterizing the intensity of electricity emissions for hydrogen production

Clean hydrogen markets present opportunities to dramatically grow green power markets and demand for green power from hydrogen production. Allowing for renewable electricity to be used to lower the carbon intensity (CI) of electricity use for hydrogen production would provide renewable generators and suppliers access to this nascent market and potentially increase the importance of hydrogen use overall.

Renewable Energy certificates (RECs) include all attributes of renewable generation, including GHG emissions, and are the standard accepted proof that 1 MWh of renewable electricity was generated and used. As such, RECs are required to substantiate delivery and use claims of the specified carbon intensity of a renewable generation unit. They are the legal and most precise means of tracking

renewable electricity² and therefore the appropriate tool to verify that renewable electricity is being used to produce clean hydrogen from an electrolyzer. All options for delivering, purchasing, or otherwise using renewable electricity in the U.S. must include RECs, including onsite generation, power purchase agreements (PPAs), and utility programs. Even in the case that a renewable generator is not registered with an electronic certificate tracking system ("Tracking Systems"), RECs are de facto created for each MWh of generation and may be transferred and retired contractually.

The Federal Trade Commission (FTC) requires REC ownership in order for an entity to state that it is using renewable electricity.³ RECs are recognized by actors in the voluntary market and in all thirty-five (35) states that require or have a goal to deliver renewable generation to users, as the common instrument used to demonstrate renewable electricity usage.⁴ The Solar Energy Industry Association (SEIA), the Interstate Renewable Energy Council (IREC), and other state and national consumer protection agencies and organizations have also published guidance and requirements that reiterate that sole REC ownership is required for renewable electricity⁵ As RECs are used to substantiate delivery claims of renewable electricity, they can only be used to verify the carbon intensity of hydrogen production processes which use electricity, e.g. electrolyzers.

In most of the U.S., RECs are only issued in Tracking Systems for certain renewable resource types. In certain regions, however, there are all-generation certificate tracking systems that track and issue certificates for production from all generation resources and each MWh of generation in the region, not only renewable facilities. In these regions, generation attribute certificates from these systems would be similarly required to demonstrate use of an eligible nonrenewable resource type (e.g. nuclear) and associated emissions. For eligible resources that are not tracked and issued certificates in a certain region as well as renewable facilities that are not registered in Tracking Systems (e.g. small resources), the environmental attributes/RECs will need to be contractually verified.

The RECs in a Green-e® certified product are verified under the Center for Resource Solutions' Green-e® program, and the seller of a Green-e® certified product is required to disclose the quantity, type, vintage, and geographic source of each certificate. Center for Resource Solutions also verifies that the RECs are not sold more than once or claimed by more than one party.

² Comments to the U.S. Securities and Exchange Commission (SEC) on Proposed Climate-Related Disclosures for Investors. Available at: <https://resource-solutions.org/document/061722/>

³ Federal Trade Commission (FTC). (2012). Guides for the Use of Environmental Marketing Claims; final rule. Available at: https://www.ftc.gov/sites/default/files/documents/federal_register_notices/guides-useenvironmental-marketing-claims-green-guides/greenguidesfrn.pdf.

⁴ Jones, et al. (2015). The Legal Basis of Renewable Energy Certificates. Available at: <http://resourcesolutions.org/wp-content/uploads/2015/07/The-Legal-Basis-for-RECs.pdf>

⁵ For example, see: Solar Energy Industry Association (SEIA). (2015). SEIA Solar Business Code. Available at: <http://www.seia.org/policy/consumer-protection/seia-solar-business-code>.
Interstate Renewable Energy Council (IREC). (2015). IREC's Clean Energy Consumer Bill of Rights. Available at: <http://www.irecusa.org/consumer/bill-of-rights.pdf>.

Hydrogen Produced by Steam Methane Reforming (SMR) and Renewable Thermal Credits, or Biogas Credits

In the United States, 95 percent of hydrogen is produced by steam methane reforming (SMR), a reaction between a methane source, such as natural gas, and high-temperature steam⁶. Biomethane, also known as renewable natural gas (RNG), is increasingly becoming a solution for commercial and residential customers who want an effective way to use fuels with lower lifecycle greenhouse gas emissions and offers a pathway to accelerate the transition to a clean energy economy and presents an opportunity to lower the carbon intensity (CI) of Hydrogen produced by SMR.

RNG markets and the CI ratings of the fuel are well-established by the EPA as well as several state programs. The EPA Renewable Identification Number (RIN) Program is an incentive to produce RNG and California's Low Carbon Fuel Standard (LCFS) allows RNG producers to generate credits based on RNG's lower carbon intensity.

There are multiple pathways for producing RNG, each with their own environmental and social considerations. Many of the same factors that are relevant to producing high quality renewable energy, such as accounting for fuel delivery, using sustainable resources, credit vintage requirements, and facility age have bearing on RNG production as well. The Green-e® Renewable Fuels program can serve as a guide for the eligibility rules for the 45V credit to ensure that RNG used in hydrogen production meets the highest standards and has positive impacts.

Renewable Fuel Certificates (RFCs) should be required as proof that SMR Hydrogen is produced with RNG. An RFC represents the environmental benefits of one dekatherm of renewable gas. For each dekatherm of renewable fuel produced, an equivalent RFC is produced. Purchasing and pairing RFCs with gas supply substantiates claims of using and receiving the benefits of that renewable fuel. RFC purchases also help build a market for renewable fuels. Increased demand for, and production of, renewable fuels helps avoid fossil natural gas extraction and processing, and helps make use of waste materials.

The RFCs in a Green-e® certified product are verified under the Center for Resource Solutions' Green-e® program, and the seller of a Green-e® certified product is required to disclose the quantity, type, vintage, carbon intensity, and geographic source of each certificate. Center for Resource Solutions also verifies that the RFCs are not sold more than once or claimed by more than one party.

⁶ For further discussion see U.S. IRS (2020). HYDROGEN STRATEGY Enabling A Low-Carbon Economy. Available at: https://www.energy.gov/sites/prod/files/2020/07/f76/USIRS_FE_Hydrogen_Strategy_July2020.pdf

Question 4(g):

If indirect book accounting factors that reduce a taxpayer's effective greenhouse gas emissions, such as zero-emission credits or power purchase agreements for clean energy, are considered in calculating the § 45V credit, what considerations (such as time, location, and vintage) should be included in determining the greenhouse gas emissions rate of these book accounting factors?

Time of Generation (vintage)

CRS can help IRS investigate and determine what REC vintage requirements are appropriate for the 45V credit. Historically, best practices in both voluntary and regulatory markets have set requirements for the vintage (i.e., time of production) for RECs depending on their use case. While there is variation on vintage requirements depending on reporting programs, renewable energy leaders such as CDP, RE100, and the Green-e® Energy program recognize that RECs should be paired with generation that is reasonably close to the time the electricity was consumed.⁷

Time of Use

As a minimum requirement for credible renewable electricity usage claims in the U.S., the Green-e® Energy program's 21-month vintage window—which includes the calendar year in which electricity use occurred, the last six months of the prior calendar year, and the first three months of the following calendar year—is a commonly used vintage requirement for RECs. However, depending on IRS's objectives and to ensure that hydrogen production benefits local renewable energy production, time-matching local renewable electricity generation (and RECs) to hydrogen production, e.g., using an hourly REC vintage requirement, may be important for this particular usage. While RECs can facilitate this hourly accounting, most Tracking Systems have not yet integrated more precise (e.g., hourly) vintage data into their systems. The market conditions necessary to sustain time-matching of RECs at scale will not likely be ready until likely 2025.

We do not recommend that IRS delay moving forward with incentivizing clean electricity use in the 45V credit until hourly RECs and other market infrastructure needed to support and scale hourly tracking and trading of generation attributes is created and widely available. Requirements can be set for hourly tracking that start at a later date and ramp up. In the meantime, IRS can support the development of tracking systems to accommodate hourly claims— integration of all-resource tracking and more precise vintage and location data.

⁷ RE100 Technical Working Group. (2016). Making Credible Renewable Electricity Usage Claims. Available at: <https://www.there100.org/sites/re100/files/2020-09/RE100%20Making%20Credible%20Claims.pdf>

Regional Considerations

While there is no need to limit REC use based on generator location or transaction type (e.g., “bundled” vs. “unbundled” renewable energy) to ensure accurate accounting and credible renewable electricity usage claims, IRS may again consider geographic restrictions on RECs to achieve local and decarbonization objectives. CRS will also be investigating these questions and gathering stakeholder feedback as part of the standard setting process for the Green-e® Renewable Fuels program.

Facility Age

In addition to vintage and geographic requirements, setting restrictions on facility age for renewable generators has long been a tool of voluntary and compliance markets to encourage new generation. With this market in a nascent stage, the Green-e® Renewable Fuels program will be exploring the potential market effects of a facility age (i.e., “new date”) requirement for electricity used in hydrogen production. Though an appropriate facility age requirement has yet to be determined, a principal concern is the risk of existing renewable generation being shifting if there is a higher financial return for its use in hydrogen production. This could create an equity issue as renewable energy that is currently being delivered, particularly to residential customers, could end up being reallocated to hydrogen production for the benefit of large corporate and commercial customers. Purchasing from newer facilities is also important if IRS’s objective is to drive more production of clean energy. To best incentivize renewable energy and thus hydrogen production that is sustainable, equitable, and impactful, the 45V credit should seek to encourage generation from newer facilities.

Question 5(a):

What certifications, professional licenses, or other qualifications, if any, should be required for an unrelated party to verify the production and sale or use of clean hydrogen for the § 45V credit, § 45 credit, and § 48 credit?

Using the Green-e® Programs

The eligibility rules for the 45V credit regarding electric generator facility age, generation vintage, and geographic restrictions, etc. should be based on IRS’s goals and desired impact. As described in the EPA’s *Guide to Purchasing Green Power*, certification and verification programs serve an important role in the voluntary market by providing oversight.⁸ The Green-e® programs do this by setting sustainability requirements for green power products ensuring environmental attributes are not claimed by multiple entities.

⁸For further discussion see EPA’s Guide to Purchasing Green Power (pg. C-5). Available at: https://www.epa.gov/sites/default/files/2016-01/documents/purchasing_guide_for_web.pdf

The Green-e® programs are developed by working and advisory groups comprised of environmental nonprofit organizations, academic experts, and industry stakeholders to provide environmental, technical, and market input. CRS is beginning a process next year to determine the rules for these factors for green hydrogen in our Green-e® Renewable Fuels certification program. As the administrator of the Green-e® programs, CRS staff would be happy to set up a call to discuss best practices and the appropriate verification measures for renewable electricity and RNG usage. CRS has extensive experience developing reporting and verification processes, and has advised state, national, and international agencies on verification approaches and procedures.

Question 5(c):

What existing industry standards, if any, should the Treasury Department and the IRS consider for the verification of production and sale or use of clean hydrogen for the § 45V credit, § 45 credit, and § 48 credit?

Please see response to Question 5(a).

ADDITIONAL COMMENTS ON THE 45V CREDIT:

While there is historic market consensus on the use of RECs to represent the delivery and use of renewable electricity, there is also a growing interest in the impact the attributes have on the grid (i.e. the avoided emissions). The “Calculating Carbon Intensity Using RECs” section below describes the difference of these two accounting approaches and their appropriate uses.

Calculating Carbon Intensity Using RECs

We recommend that RECs be used to characterize the generation (and CI) of the electricity used to produce hydrogen, specifically to verify use of a renewable generation source with a specified emissions rate or CI. Calculating the emissions associated with the electricity used to produce hydrogen is “attributional” emissions accounting, and the CI is based on the direct emissions from the generation used (e.g., zero for wind, solar, and hydropower generation). This is in contrast to “consequential” accounting, which calculates the grid emissions effect of electricity use for hydrogen production and the grid emissions effect of any renewable electricity (RECs) that is purchased for hydrogen production, e.g., using marginal grid emissions (or CI) data. While consequential accounting can provide an indication of the carbon impact of hydrogen production and renewable electricity used for hydrogen production, it cannot characterize the CI of electricity used for production, in which case “clean hydrogen” refers to the impact of hydrogen production on clean electricity production as opposed to the use of clean electricity to produce clean hydrogen.⁹

⁹ For more information, see CRS. (2022). Guide to Electricity Sector Greenhouse Gas Emissions Totals. Available at: <https://resource-solutions.org/wp-content/uploads/2022/11/Guide-to-Electricity-Sector-Greenhouse-Gas-Emissions-Totals.pdf>.

Electricity Carbon Intensity Scores from Emitting Generation

While there may be advantages to using utility-specific and even electricity product-specific CI data, this data is not yet widely available and can be inconsistent in terms of quality and methodology. There is a strong consensus that consumers can claim to be using Standard Delivery Renewable Energy when renewable energy attributes and other requirements for credible renewable electricity usage claims are substantiated using credible data. CRS has proposed a framework of credibility criteria and quality considerations that may be used to evaluate data sources available to customers and explains how to integrate this information into renewable energy reporting. The framework also provides guidance on how to report active procurement and Standard Delivery Renewable Energy together when calculating renewable energy use.

If the time of (or hourly) production and use is being accounted for, then grid power used for hydrogen production should be accounted for based on the hourly mix of generating resources at the time of production plus the attributes associated with that generation. CRS could work with IRS verifying hourly and time-coincident use of local generation both with and without time-stamped/hourly RECs.¹⁰

We thank you for this opportunity to provide comments on the Clean Hydrogen Production Standard Draft Guidance. Please feel free to reach out with any questions or comments.

Sincerely,

_____/s/____

Lucas Grimes
Manager, Policy

¹⁰ CRS (2021). Accounting for Standard Delivery Renewable Energy. Available at: <https://resource-solutions.org/document/030921/>